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PROGRESS REPORT  
FOR  
SEPTEMBER 1960  
ON THE  
SIGNAL FLARE STUDY  
RD 45, TASK ORDER LL

27 October 1960

During the month of September 1960, a new shipment of Kilgore flares was received and tested the same as the previous group.

The first test consisted of burning twenty flares of the Kilgore red and twenty flares of the Kilgore yellow under ambient conditions from which the following results were noted.

I. International Flare Signal Division (Kilgore) Red

- A. All 20 burned to completion.
- B. All these flares were easy to ignite but were chimneying excessively. Three had loose plastic base plugs. One had a cracked matchhead and one striker pulled out of its cap.
- C. Average time to full flame was 1-1/4 minutes; maximum burning time 35 minutes; minimum burning time 33 minutes and average burning time 34.05 minutes.

II. International Flare Signal Division (Kilgore) Yellow

- A. All 20 of these flares burned to completion.
- B. All of these flares were easy to ignite, but were chimneying excessively.
- C. Average time to full flame was 1-1/4 minutes; maximum burning time 30 minutes; minimum burning time 27 minutes and average burning time 28.15 minutes.

The second test consisted of burning 10 flares of the Kilgore red and 10 of the Kilgore yellow immediately after they had been kept in an oven at 110°F for five days. The following results were noted.

- I. International Flare Signal Division (Kilgore) Red
  - A. All 10 burned to completion. Two had loose plastic base plugs.
  - B. Ease of ignition was good but chimneying was excessive.
  - C. Time to full flame ranged from 1 to 2-1/2 minutes; maximum burning time 33 minutes; minimum burning time 32 minutes and average burning time 32.2 minutes.
- II. International Flare Signal Division (Kilgore) Yellow
  - A. All 10 flares burned to completion.
  - B. Ease of ignition was good but chimneying was excessive.
  - C. Average time to full flame was 1-1/4 minutes; maximum burning time 27 minutes; minimum burning time 26 minutes and average burning time 26.4 minutes.

The third test which will consist of burning 10 flares of the Kilgore red and 10 of the Kilgore yellow immediately after they have been kept at -20°F for five days will be completed next month.

Some tests were made to light flares which had been under water for 10 minutes, but none would ignite and burn.

Another test was made to see if any of the flares could burn under water for 2 minutes. None of the flares burned under water for even 1/4 minute.

A simulated rain storm test was made with wind velocity of 15 mph. The Standard flare went out in 30 minutes and one-third of the flare remained unburned. The Olin flare burned weakly with excessive chimneying, however, it did burn to completion in 42 minutes. The Bristol red flare went out in 20 minutes with approximately one-half remaining unburnt, but the Bristol yellow flare burned to completion in 20 minutes. Two Kilgore red flares went out within two minutes and one Kilgore yellow flare went out in one minute. A second Kilgore yellow flare had excessive chimneying, but burned to completion.

#### FUTURE WORK

Next month it is planned to test the brightness and color at night making both ground and aerial observations.

#### FINANCIAL STATEMENT

Total Amount of Contract	\$ 3,372.00
Expenditures for September 1960	330.18
Total Expenditures to 30 September 1960	1,492.79
Balance of Contract	1,879.21

Expiration Date: 23 November 1960